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SEQUENCE LISTING

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<100> Inventors, Lucilla
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Leach, Dana
Nielsen, Klaus
Karlsson, Gunilla
Rasmussen, Peter

<120> Novel Methods for Therapeutic Vaccination

<130> 3631-109P

<140> US 09/806,703

<141> 2001-04-04

<150> PCT/DK99/00525

<151> 1999-10-05

<150> DK 1998 01261

<151> 1998-10-05

<150> DK 60/105,011

<151> 1998-10-20

<160> 33

<170> PatentIn version 3.0

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Gln Leu Cys Ala Arg Gly His Cys Trp Gly Pro Gly Pro Thr Gln Cys	
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Val Asn Cys Ser Gln Phe Leu Arg Gly Gln Glu Cys Val Glu Glu Cys	
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Arg Val Leu Gln Gly Leu Pro Arg Glu Tyr Val Asn Ala Arg His Cys	
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Leu Pro Cys His Pro Glu Cys Gln Pro Gln Asn Gly Ser Val Thr Cys	
565 570 575	
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Phe Gly Pro Glu Ala Asp Gln Cys Val Ala Cys Ala His Tyr Lys Asp	
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Pro Pro Phe Cys Val Ala Arg Cys Pro Ser Gly Val Lys Pro Asp Leu	
595 600 605	
tcc tac atg ccc atc tgg aag ttt cca gat gag gag ggc gca tgc cag	1872
Ser Tyr Met Pro Ile Trp Lys Phe Pro Asp Glu Glu Gly Ala Cys Gln	
610 615 620	
cct tgc ccc atc aac tgc acc cac tcc tgt gtg gac ctg gat gac aag	1920
Pro Cys Pro Ile Asn Cys Thr His Ser Cys Val Asp Leu Asp Asp Lys	
625 630 635 640	
ggc tgc ccc gcc gag cag aga gcc agc cct ctg acg tcc atc gtc tct	1968
Gly Cys Pro Ala Glu Gln Arg Ala Ser Pro Leu Thr Ser Ile Val Ser	
645 650 655	
gcg gtg gtt ggc att ctg ctg gtc gtg gtc ttg ggg gtg gtc ttt ggg	2016
Ala Val Val Gly Ile Leu Leu Val Val Val Leu Gly Val Val Phe Gly	
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Ile Leu Ile Lys Arg Arg Gln Gln Lys Ile Arg Lys Tyr Thr Met Arg	
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Arg Leu Leu Gln Glu Thr Glu Leu Val Glu Pro Leu Thr Pro Ser Gly	
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Arg Lys Val Lys Val Leu Gly Ser Gly Ala Phe Gly Thr Val Tyr Lys	
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Gly Ile Trp Ile Pro Asp Gly Glu Asn Val Lys Ile Pro Val Ala Ile	
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Lys Val Leu Arg Glu Asn Thr Ser Pro Lys Ala Asn Lys Glu Ile Leu	
755 760 765	
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Asp Glu Ala Tyr Val Met Ala Gly Val Gly Ser Pro Tyr Val Ser Arg	
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Met Pro Tyr Gly Cys Leu Leu Asp His Val Arg Glu Asn Arg Gly Arg	
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Leu Gly Ser Gln Asp Leu Leu Asn Trp Cys Met Gln Ile Ala Lys Gly	
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Met Ser Tyr Leu Glu Asp Val Arg Leu Val His Arg Asp Leu Ala Ala	
835 840 845	
cgg aac gtg ctg gtc aag agt ccc aac cat gtc aaa att aca gac ttc	2592
Arg Asn Val Leu Val Lys Ser Pro Asn His Val Lys Ile Thr Asp Phe	
850 855 860	
ggg ctg gct cgg ctg ctg gac att gac gag aca gag tac cat gca gat	2640
Gly Leu Ala Arg Leu Leu Asp Ile Asp Glu Thr Glu Tyr His Ala Asp	
865 870 875 880	
ggg ggc aag gtg ccc atc aag tgg atg gcg ctg gag tcc att ctc cgc	2688
Gly Gly Lys Val Pro Ile Lys Trp Met Ala Leu Glu Ser Ile Leu Arg	
885 890 895	
cgg cgg ttc acc cac cag agt gat gtg tgg agt tat ggt gtg act gtg	2736
Arg Arg Phe Thr His Gln Ser Asp Val Trp Ser Tyr Gly Val Thr Val	
900 905 910	
tgg gag ctg atg act ttt ggg gcc aaa cct tac gat ggg atc cca gcc	2784
Trp Glu Leu Met Thr Phe Gly Ala Lys Pro Tyr Asp Gly Ile Pro Ala	
915 920 925	
cgg gag atc cct gac ctg ctg gaa aag ggg gag cgg ctg ccc cag ccc	2832
Arg Glu Ile Pro Asp Leu Leu Glu Lys Gly Glu Arg Leu Pro Gln Pro	
930 935 940	
ccc atc tgc acc att gat gtc tac atg atc atg gtc aaa tgt tgg atg	2880

Pro 945	Ile	Cys	Thr	Ile	Asp	Val	Tyr	Met	Ile	Met	Val	Lys	Cys	Trp	Met	
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tcc Ser	cgc Arg	atg Met	gcc Ala	agg Arg	gac Asp	ccc Pro	cag Gln	cgc Arg	ttt Phe	gtg Val	gtc Val	atc Ile	cag Gln	aat Asn	gag Glu	2976
			980					985					990			
gac Asp	ttg Leu	ggc Gly	cca Pro	gcc Ala	agt Ser	ccc Pro	ttg Leu	gac Asp	agc Ser	acc Thr	ttc Phe	tac Tyr	cgc Arg	tca Ser	ctg Leu	3024
		995					1000					1005				
ctg Leu	gag Glu	gac Asp	gat Asp	gac Asp	atg Met	ggg Gly	gac Asp	ctg Leu	gtg Val	gat Asp	gct Ala	gag Glu	gag Glu	tat Tyr		3069
	1010					1015					1020					
ctg Leu	gta Val	ccc Pro	cag Gln	cag Gln	ggc Gly	ttc Phe	ttc Phe	tgt Cys	cca Pro	gac Asp	cct Pro	gcc Ala	ccg Pro	ggc Gly		3114
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gct Ala	ggg Gly	ggc Gly	atg Met	gtc Val	cac His	cac His	agg Arg	cac His	cgc Arg	agc Ser	tca Ser	tct Ser	acc Thr	agg Arg		3159
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	1070					1075					1080					
gat Asp	gta Val	ttt Phe	gat Asp	ggt Gly	gac Asp	ctg Leu	gga Gly	atg Met	ggg Gly	gca Ala	gcc Ala	aag Lys	ggg Gly	ctg Leu		3294
	1085					1090				1095						
caa Gln	agc Ser	ctc Leu	ccc Pro	aca Thr	cat His	gac Asp	ccc Pro	agc Ser	cct Pro	cta Leu	cag Gln	cgg Arg	tac Tyr	agt Ser		3339
	1100					1105					1110					
gag Glu	gac Asp	ccc Pro	aca Thr	gta Val	ccc Pro	ctg Leu	ccc Pro	tct Ser	gag Glu	act Thr	gat Asp	ggc Gly	tac Tyr	gtt Val		3384
	1115					1120					1125					
gcc Ala	ccc Pro	ctg Leu	acc Thr	tgc Cys	agc Ser	ccc Pro	cag Gln	cct Pro	gaa Glu	tat Tyr	gtg Val	aac Asn	cag Gln	cca Pro		3429
	1130					1135					1140					
gat Asp	gtt Val	cgg Arg	ccc Pro	cag Gln	ccc Pro	cct Pro	tcg Ser	ccc Pro	cga Arg	gag Glu	ggc Gly	cct Pro	ctg Leu	cct Pro		3474
	1145					1150					1155					
gct Ala	gcc Ala	cga Arg	cct Pro	gct Ala	ggt Gly	gcc Ala	act Thr	ctg Leu	gaa Glu	agg Arg	gcc Ala	aag Lys	act Thr	ctc Leu		3519

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Ser Pro Gly Lys Asn Gly Val	Val Lys Asp Val Phe	Ala Phe Gly	
1175	1180	1185	
ggt gcc gtg gag aac ccc gag	tac ttg aca ccc cag	gga gga gct	3609
Gly Ala Val Glu Asn Pro Glu	Tyr Leu Thr Pro Gln	Gly Gly Ala	
1190	1195	1200	
gcc cct cag ccc cac cct cct	cct gcc ttc agc cca	gcc ttc gac	3654
Ala Pro Gln Pro His Pro Pro	Pro Ala Phe Ser Pro	Ala Phe Asp	
1205	1210	1215	
aac ctc tat tac tgg gac cag	gac cca cca gag cgg	ggg gct cca	3699
Asn Leu Tyr Tyr Trp Asp Gln	Asp Pro Pro Glu Arg	Gly Ala Pro	
1220	1225	1230	
ccc agc acc ttc aaa ggg aca	cct acg gca gag aac	cca gag tac	3744
Pro Ser Thr Phe Lys Gly Thr	Pro Thr Ala Glu Asn	Pro Glu Tyr	
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 <212> PRT
 <213> Homo sapiens

<400> 4

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 35 40 45

Leu Tyr Gln Gly Cys Gln Val Val Gln Gly Asn Leu Glu Leu Thr Tyr
 50 55 60

Leu Pro Thr Asn Ala Ser Leu Ser Phe Leu Gln Asp Ile Gln Glu Val
 65 70 75 80

Gln Gly Tyr Val Leu Ile Ala His Asn Gln Val Arg Gln Val Pro Leu
 85 90 95

Gln Arg Leu Arg Ile Val Arg Gly Thr Gln Leu Phe Glu Asp Asn Tyr
100 105 110

Ala Leu Ala Val Leu Asp Asn Gly Asp Pro Leu Asn Asn Thr Thr Pro
115 120 125

Val Thr Gly Ala Ser Pro Gly Gly Leu Arg Glu Leu Gln Leu Arg Ser
130 135 140

Leu Thr Glu Ile Leu Lys Gly Gly Val Leu Ile Gln Arg Asn Pro Gln
145 150 155 160

Leu Cys Tyr Gln Asp Thr Ile Leu Trp Lys Asp Ile Phe His Lys Asn
165 170 175

Asn Gln Leu Ala Leu Thr Leu Ile Asp Thr Asn Arg Ser Arg Ala Cys
180 185 190

His Pro Cys Ser Pro Met Cys Lys Gly Ser Arg Cys Trp Gly Glu Ser
195 200 205

Ser Glu Asp Cys Gln Ser Leu Thr Arg Thr Val Cys Ala Gly Gly Cys
210 215 220

Ala Arg Cys Lys Gly Pro Leu Pro Thr Asp Cys Cys His Glu Gln Cys
225 230 235 240

Ala Ala Gly Cys Thr Gly Pro Lys His Ser Asp Cys Leu Ala Cys Leu
245 250 255

His Phe Asn His Ser Gly Ile Cys Glu Leu His Cys Pro Ala Leu Val
260 265 270

Thr Tyr Asn Thr Asp Thr Phe Glu Ser Met Pro Asn Pro Glu Gly Arg
275 280 285

Tyr Thr Phe Gly Ala Ser Cys Val Thr Ala Cys Pro Tyr Asn Tyr Leu
290 295 300

Ser Thr Asp Val Gly Ser Cys Thr Leu Val Cys Pro Leu His Asn Gln
305 310 315 320

Glu Val Thr Ala Glu Asp Gly Thr Gln Arg Cys Glu Lys Cys Ser Lys
325 330 335

Pro Cys Ala Arg Val Cys Tyr Gly Leu Gly Met Glu His Leu Arg Glu
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Val Arg Ala Val Thr Ser Ala Asn Ile Gln Glu Phe Ala Gly Cys Lys
355 360 365

Lys Ile Phe Gly Ser Leu Ala Phe Leu Pro Glu Ser Phe Asp Gly Asp
370 375 380

Pro Ala Ser Asn Thr Ala Pro Leu Gln Pro Glu Gln Leu Gln Val Phe
385 390 395 400

Glu Thr Leu Glu Glu Ile Thr Gly Tyr Leu Tyr Ile Ser Ala Trp Pro
405 410 415

Asp Ser Leu Pro Asp Leu Ser Val Phe Gln Asn Leu Gln Val Ile Arg
420 425 430

Gly Arg Ile Leu His Asn Gly Ala Tyr Ser Leu Thr Leu Gln Gly Leu
435 440 445

Gly Ile Ser Trp Leu Gly Leu Arg Ser Leu Arg Glu Leu Gly Ser Gly
450 455 460

Leu Ala Leu Ile His His Asn Thr His Leu Cys Phe Val His Thr Val
465 470 475 480

Pro Trp Asp Gln Leu Phe Arg Asn Pro His Gln Ala Leu Leu His Thr
485 490 495

Ala Asn Arg Pro Glu Asp Glu Cys Val Gly Glu Gly Leu Ala Cys His
500 505 510

Gln Leu Cys Ala Arg Gly His Cys Trp Gly Pro Gly Pro Thr Gln Cys
515 520 525

Val Asn Cys Ser Gln Phe Leu Arg Gly Gln Glu Cys Val Glu Glu Cys
530 535 540

Arg Val Leu Gln Gly Leu Pro Arg Glu Tyr Val Asn Ala Arg His Cys

545 550 555 560

 Leu Pro Cys His Pro Glu Cys Gln Pro Gln Asn Gly Ser Val Thr Cys
 565 570 575

 Phe Gly Pro Glu Ala Asp Gln Cys Val Ala Cys Ala His Tyr Lys Asp
 580 585 590

 Pro Pro Phe Cys Val Ala Arg Cys Pro Ser Gly Val Lys Pro Asp Leu
 595 600 605

 Ser Tyr Met Pro Ile Trp Lys Phe Pro Asp Glu Glu Gly Ala Cys Gln
 610 615 620

 Pro Cys Pro Ile Asn Cys Thr His Ser Cys Val Asp Leu Asp Asp Lys
 625 630 635 640

 Gly Cys Pro Ala Glu Gln Arg Ala Ser Pro Leu Thr Ser Ile Val Ser
 645 650 655

 Ala Val Val Gly Ile Leu Leu Val Val Val Leu Gly Val Val Phe Gly
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 Ile Leu Ile Lys Arg Arg Gln Gln Lys Ile Arg Lys Tyr Thr Met Arg
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 Arg Leu Leu Gln Glu Thr Glu Leu Val Glu Pro Leu Thr Pro Ser Gly
 690 695 700

 Ala Met Pro Asn Gln Ala Gln Met Arg Ile Leu Lys Glu Thr Glu Leu
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 Gly Ile Trp Ile Pro Asp Gly Glu Asn Val Lys Ile Pro Val Ala Ile
 740 745 750

 Lys Val Leu Arg Glu Asn Thr Ser Pro Lys Ala Asn Lys Glu Ile Leu
 755 760 765

 Asp Glu Ala Tyr Val Met Ala Gly Val Gly Ser Pro Tyr Val Ser Arg
 770 775 780

Leu Leu Gly Ile Cys Leu Thr Ser Thr Val Gln Leu Val Thr Gln Leu
785 790 795 800

Met Pro Tyr Gly Cys Leu Leu Asp His Val Arg Glu Asn Arg Gly Arg
805 810 815

Leu Gly Ser Gln Asp Leu Leu Asn Trp Cys Met Gln Ile Ala Lys Gly
820 825 830

Met Ser Tyr Leu Glu Asp Val Arg Leu Val His Arg Asp Leu Ala Ala
835 840 845

Arg Asn Val Leu Val Lys Ser Pro Asn His Val Lys Ile Thr Asp Phe
850 855 860

Gly Leu Ala Arg Leu Leu Asp Ile Asp Glu Thr Glu Tyr His Ala Asp
865 870 875 880

Gly Gly Lys Val Pro Ile Lys Trp Met Ala Leu Glu Ser Ile Leu Arg
885 890 895

Arg Arg Phe Thr His Gln Ser Asp Val Trp Ser Tyr Gly Val Thr Val
900 905 910

Trp Glu Leu Met Thr Phe Gly Ala Lys Pro Tyr Asp Gly Ile Pro Ala
915 920 925

Arg Glu Ile Pro Asp Leu Leu Glu Lys Gly Glu Arg Leu Pro Gln Pro
930 935 940

Pro Ile Cys Thr Ile Asp Val Tyr Met Ile Met Val Lys Cys Trp Met
945 950 955 960

Ile Asp Ser Glu Cys Arg Pro Arg Phe Arg Glu Leu Val Ser Glu Phe
965 970 975

Ser Arg Met Ala Arg Asp Pro Gln Arg Phe Val Val Ile Gln Asn Glu
980 985 990

Asp Leu Gly Pro Ala Ser Pro Leu Asp Ser Thr Phe Tyr Arg Ser Leu
995 1000 1005

Leu Glu Asp Asp Asp Met Gly Asp Leu Val Asp Ala Glu Glu Tyr
1010 1015 1020

Leu Val Pro Gln Gln Gly Phe Phe Cys Pro Asp Pro Ala Pro Gly
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Ala Gly Gly Met Val His His Arg His Arg Ser Ser Ser Thr Arg
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Ser Gly Gly Gly Asp Leu Thr Leu Gly Leu Glu Pro Ser Glu Glu
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Glu Ala Pro Arg Ser Pro Leu Ala Pro Ser Glu Gly Ala Gly Ser
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Asp Val Phe Asp Gly Asp Leu Gly Met Gly Ala Ala Lys Gly Leu
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Gln Ser Leu Pro Thr His Asp Pro Ser Pro Leu Gln Arg Tyr Ser
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Glu Asp Pro Thr Val Pro Leu Pro Ser Glu Thr Asp Gly Tyr Val
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Ala Pro Leu Thr Cys Ser Pro Gln Pro Glu Tyr Val Asn Gln Pro
1130 1135 1140

Asp Val Arg Pro Gln Pro Pro Ser Pro Arg Glu Gly Pro Leu Pro
1145 1150 1155

Ala Ala Arg Pro Ala Gly Ala Thr Leu Glu Arg Ala Lys Thr Leu
1160 1165 1170

Ser Pro Gly Lys Asn Gly Val Val Lys Asp Val Phe Ala Phe Gly
1175 1180 1185

Gly Ala Val Glu Asn Pro Glu Tyr Leu Thr Pro Gln Gly Gly Ala
1190 1195 1200

Ala Pro Gln Pro His Pro Pro Pro Ala Phe Ser Pro Ala Phe Asp
1205 1210 1215

Asn Leu Tyr Tyr Trp Asp Gln Asp Pro Pro Glu Arg Gly Ala Pro
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Pro Ser Thr Phe Lys Gly Thr Pro Thr Ala Glu Asn Pro Glu Tyr
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 Val Leu Cys Leu Gln Ala Gln Val Thr Val Gln Ser Ser Pro Asn Phe
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 aca cag cat gtg agg gag cag agc ctg gtg acg gat cag ctc agc cgc 144
 Thr Gln His Val Arg Glu Gln Ser Leu Val Thr Asp Gln Leu Ser Arg
 35 40 45
 cgc ctc atc cgg acc tac cag ctc tac agc cgc acc agc ggg aag cac 192
 Arg Leu Ile Arg Thr Tyr Gln Leu Tyr Ser Arg Thr Ser Gly Lys His
 50 55 60
 gtg cag gtc ctg gcc aac aag cgc atc aac gcc atg gca gaa gac gga 240
 Val Gln Val Leu Ala Asn Lys Arg Ile Asn Ala Met Ala Glu Asp Gly
 65 70 75 80
 gac ccc ttc gcg aag ctc att gtg gag acc gat act ttt gga agc aga 288
 Asp Pro Phe Ala Lys Leu Ile Val Glu Thr Asp Thr Phe Gly Ser Arg
 85 90 95
 gtc cga gtt cgc ggc gca gag aca ggt ctc tac atc tgc atg aac aag 336
 Val Arg Val Arg Gly Ala Glu Thr Gly Leu Tyr Ile Cys Met Asn Lys
 100 105 110
 aag ggg aag cta att gcc aag agc aac ggc aaa ggc aag gac tgc gta 384
 Lys Gly Lys Leu Ile Ala Lys Ser Asn Gly Lys Gly Lys Asp Cys Val
 115 120 125
 ttc aca gag atc gtg ctg gag aac aac tac acg gcg ctg cag aac gcc 432
 Phe Thr Glu Ile Val Leu Glu Asn Asn Tyr Thr Ala Leu Gln Asn Ala
 130 135 140

aag tac gag ggc tgg tac atg gcc ttt acc cgc aag ggc cgg ccc cgc 480
 Lys Tyr Glu Gly Trp Tyr Met Ala Phe Thr Arg Lys Gly Arg Pro Arg
 145 150 155 160

aag ggc tcc aag acg cgc cag cat cag cgc gag gtg cac ttc atg aag 528
 Lys Gly Ser Lys Thr Arg Gln His Gln Arg Glu Val His Phe Met Lys
 165 170 175

cgc ctg ccg cgg ggc cac cac acc acc gag cag agc ctg cgc ttc gag 576
 Arg Leu Pro Arg Gly His His Thr Thr Glu Gln Ser Leu Arg Phe Glu
 180 185 190

ttc ctc aac tac ccg ccc ttc acg cgc agc ctg cgc ggc agc cag agg 624
 Phe Leu Asn Tyr Pro Pro Phe Thr Arg Ser Leu Arg Gly Ser Gln Arg
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act tgg gcc ccg gag ccc cga tag 648
 Thr Trp Ala Pro Glu Pro Arg
 210 215

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 <213> Homo sapiens

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Thr Gln His Val Arg Glu Gln Ser Leu Val Thr Asp Gln Leu Ser Arg
 35 40 45

Arg Leu Ile Arg Thr Tyr Gln Leu Tyr Ser Arg Thr Ser Gly Lys His
 50 55 60

Val Gln Val Leu Ala Asn Lys Arg Ile Asn Ala Met Ala Glu Asp Gly
 65 70 75 80

Asp Pro Phe Ala Lys Leu Ile Val Glu Thr Asp Thr Phe Gly Ser Arg
 85 90 95

Val Arg Val Arg Gly Ala Glu Thr Gly Leu Tyr Ile Cys Met Asn Lys
 100 105 110

Lys Gly Lys Leu Ile Ala Lys Ser Asn Gly Lys Gly Lys Asp Cys Val
 115 120 125

Phe Thr Glu Ile Val Leu Glu Asn Asn Tyr Thr Ala Leu Gln Asn Ala
 130 135 140

Lys Tyr Glu Gly Trp Tyr Met Ala Phe Thr Arg Lys Gly Arg Pro Arg
 145 150 155 160

Lys Gly Ser Lys Thr Arg Gln His Gln Arg Glu Val His Phe Met Lys
 165 170 175

Arg Leu Pro Arg Gly His His Thr Thr Glu Gln Ser Leu Arg Phe Glu
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Thr Trp Ala Pro Glu Pro Arg
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 Arg Gln Arg Trp Leu Arg Val Gly Thr Leu Val Leu Ala Leu Thr Gly
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 acc ttc ctg att ggc ttc ctg ttt ggg tgg ttt ata aaa cct tcc aat 144
 Thr Phe Leu Ile Gly Phe Leu Phe Gly Trp Phe Ile Lys Pro Ser Asn
 35 40 45
 gaa gct act ggt aat gtt tcc cat tct ggc atg aag aag gag ttt ttg 192
 Glu Ala Thr Gly Asn Val Ser His Ser Gly Met Lys Lys Glu Phe Leu
 50 55 60
 cat gaa ttg aag gct gag aac atc aaa aaa ttt tta tac aat ttc aca 240
 His Glu Leu Lys Ala Glu Asn Ile Lys Lys Phe Leu Tyr Asn Phe Thr
 65 70 75 80

cgg aca cca cac ttg gca gga aca caa aat aat ttt gag ctt gca aag Arg Thr Pro His Leu Ala Gly Thr Gln Asn Asn Phe Glu Leu Ala Lys 85 90 95	288
caa att cat gac cag tgg aaa gaa ttt ggc ctg gat ttg gtt gag tta Gln Ile His Asp Gln Trp Lys Glu Phe Gly Leu Asp Leu Val Glu Leu 100 105 110	336
tcc cat tac gat gtc ttg ctg tcc tat cca aat aaa act cat cct aac Ser His Tyr Asp Val Leu Leu Ser Tyr Pro Asn Lys Thr His Pro Asn 115 120 125	384
tat atc tca ata att aat gaa gat gga aat gag att ttc aaa aca tca Tyr Ile Ser Ile Ile Asn Glu Asp Gly Asn Glu Ile Phe Lys Thr Ser 130 135 140	432
tta tct gaa cag cca ccc cca gga tat gag aat ata tca gat gta gtg Leu Ser Glu Gln Pro Pro Pro Gly Tyr Glu Asn Ile Ser Asp Val Val 145 150 155 160	480
cca cca tac agt gcc ttc tct cca caa ggg aca cca gag ggt gat cta Pro Pro Tyr Ser Ala Phe Ser Pro Gln Gly Thr Pro Glu Gly Asp Leu 165 170 175	528
gtg tat gtc aac tat gca cga act gaa gac ttc ttt aaa ctg gaa cgg Val Tyr Val Asn Tyr Ala Arg Thr Glu Asp Phe Phe Lys Leu Glu Arg 180 185 190	576
gaa atg aag atc agt tgt tct ggg aag att gtg att gcc aga tat ggg Glu Met Lys Ile Ser Cys Ser Gly Lys Ile Val Ile Ala Arg Tyr Gly 195 200 205	624
aaa gtg ttc aga gga aat atg gtt aaa aat gct caa ctg gca ggg gca Lys Val Phe Arg Gly Asn Met Val Lys Asn Ala Gln Leu Ala Gly Ala 210 215 220	672
aaa gga atg att ctg tac tca gac cct gct gac tac ttt gtt cct gcg Lys Gly Met Ile Leu Tyr Ser Asp Pro Ala Asp Tyr Phe Val Pro Ala 225 230 235 240	720
gtg aag tcc tat cca gat ggc tgg aac ctc cct gga ggt ggt gtc caa Val Lys Ser Tyr Pro Asp Gly Trp Asn Leu Pro Gly Gly Gly Val Gln 245 250 255	768
cgt gga aat gtc tta aat ctt aat ggt gca ggt gac ccg ctc aca cca Arg Gly Asn Val Leu Asn Leu Asn Gly Ala Gly Asp Pro Leu Thr Pro 260 265 270	816
ggt tac cca gca aat gaa cat gct tat agg cat gag ttg aca aac gct Gly Tyr Pro Ala Asn Glu His Ala Tyr Arg His Glu Leu Thr Asn Ala 275 280 285	864
gtt ggc ctt cca agt att cct gtc cat cct att gga tat gat gat gca Val Gly Leu Pro Ser Ile Pro Val His Pro Ile Gly Tyr Asp Asp Ala 290 295 300	912

cag aaa ctc tta gaa cac atg ggt ggt cca gca ccc cct gac agt agc	960
Gln Lys Leu Leu Glu His Met Gly Gly Pro Ala Pro Pro Asp Ser Ser	
305 310 315 320	
tggaag gga gga tta aaa gtg cct tac aac gtg gga cct ggc ttt gct	1008
Trp Lys Gly Gly Leu Lys Val Pro Tyr Asn Val Gly Pro Gly Phe Ala	
325 330 335	
gga aac ttt tca aca caa aag gtc aag atg cat att cac tct tac act	1056
Gly Asn Phe Ser Thr Gln Lys Val Lys Met His Ile His Ser Tyr Thr	
340 345 350	
aaa gtg aca aga atc tat aat gtc att ggc acc ctc aaa gga gct ctg	1104
Lys Val Thr Arg Ile Tyr Asn Val Ile Gly Thr Leu Lys Gly Ala Leu	
355 360 365	
gaa cca gac aga tat gtt att ctt gga ggt cac cga gac gct tgg gta	1152
Glu Pro Asp Arg Tyr Val Ile Leu Gly Gly His Arg Asp Ala Trp Val	
370 375 380	
ttt ggt ggc att gac cct cag agt gga gca gct gtt gtt cat gaa att	1200
Phe Gly Gly Ile Asp Pro Gln Ser Gly Ala Ala Val Val His Glu Ile	
385 390 395 400	
gtg cgg agc ttt gga acc ctg aag aag aaa gga cgg agg cct aga agg	1248
Val Arg Ser Phe Gly Thr Leu Lys Lys Lys Gly Arg Arg Pro Arg Arg	
405 410 415	
aca att ttg ttt gca agc tgg gat gca gaa gaa ttt ggc ctt ctt ggt	1296
Thr Ile Leu Phe Ala Ser Trp Asp Ala Glu Glu Phe Gly Leu Leu Gly	
420 425 430	
tct act gag tgg gca gag gaa cat tca aga ctc cta caa gag cga ggt	1344
Ser Thr Glu Trp Ala Glu Glu His Ser Arg Leu Leu Gln Glu Arg Gly	
435 440 445	
gtg gct tat att aat gct gat tct tcc ata gaa gga aat tac act cta	1392
Val Ala Tyr Ile Asn Ala Asp Ser Ser Ile Glu Gly Asn Tyr Thr Leu	
450 455 460	
aga gtt gat tgc aca cca ctg atg tac agc tta gtg tac aac cta aca	1440
Arg Val Asp Cys Thr Pro Leu Met Tyr Ser Leu Val Tyr Asn Leu Thr	
465 470 475 480	
aaa gag ctg caa agc cca gat gaa ggt ttt gaa gga aaa tct ctt tat	1488
Lys Glu Leu Gln Ser Pro Asp Glu Gly Phe Glu Gly Lys Ser Leu Tyr	
485 490 495	
gac agc tgg aaa gaa aag agt cct tca cct gag ttc att gga atg ccc	1536
Asp Ser Trp Lys Glu Lys Ser Pro Ser Pro Glu Phe Ile Gly Met Pro	
500 505 510	
aga att agc aag ctg ggg tct ggc aat gat ttt gaa gtg ttc ttc caa	1584
Arg Ile Ser Lys Leu Gly Ser Gly Asn Asp Phe Glu Val Phe Phe Gln	
515 520 525	
aga ctt gga att gct tca ggc aga gcc cga tat act aaa aat tgg aaa	1632

Arg	Leu	Gly	Ile	Ala	Ser	Gly	Arg	Ala	Arg	Tyr	Thr	Lys	Asn	Trp	Lys		
530						535					540						
act	aac	aaa	gtc	agc	agc	tat	cct	ctc	tat	cac	agt	gtc	tat	gaa	aca	1680	
Thr	Asn	Lys	Val	Ser	Ser	Tyr	Pro	Leu	Tyr	His	Ser	Val	Tyr	Glu	Thr		
545					550					555					560		
tat	gag	ctg	gta	gta	aaa	ttt	tat	gac	cca	aca	ttt	aaa	tac	cac	ctc	1728	
Tyr	Glu	Leu	Val	Val	Lys	Phe	Tyr	Asp	Pro	Thr	Phe	Lys	Tyr	His	Leu		
				565					570					575			
act	gtg	gcc	cag	gtt	cga	gga	gcg	atg	gta	ttt	gaa	ctt	gcc	aat	tct	1776	
Thr	Val	Ala	Gln	Val	Arg	Gly	Ala	Met	Val	Phe	Glu	Leu	Ala	Asn	Ser		
			580					585					590				
ata	gtg	ctt	ccc	ttt	gac	tgc	caa	agt	tat	gct	gta	gct	ctg	aag	aag	1824	
Ile	Val	Leu	Pro	Phe	Asp	Cys	Gln	Ser	Tyr	Ala	Val	Ala	Leu	Lys	Lys		
		595					600					605					
tat	gct	gac	act	atc	tac	aat	att	tca	atg	aaa	cat	cca	caa	gaa	atg	1872	
Tyr	Ala	Asp	Thr	Ile	Tyr	Asn	Ile	Ser	Met	Lys	His	Pro	Gln	Glu	Met		
	610					615					620						
aag	gct	tac	atg	ata	tca	ttt	gat	tca	ctg	ttt	tct	gca	gtc	aat	aat	1920	
Lys	Ala	Tyr	Met	Ile	Ser	Phe	Asp	Ser	Leu	Phe	Ser	Ala	Val	Asn	Asn		
625					630					635					640		
ttt	aca	gat	gtt	gca	tct	aag	ttc	aat	cag	aga	ctg	caa	gag	tta	gac	1968	
Phe	Thr	Asp	Val	Ala	Ser	Lys	Phe	Asn	Gln	Arg	Leu	Gln	Glu	Leu	Asp		
				645					650					655			
aaa	agc	aac	ccc	ata	tta	ctg	aga	att	atg	aat	gac	cag	ctg	atg	tat	2016	
Lys	Ser	Asn	Pro	Ile	Leu	Leu	Arg	Ile	Met	Asn	Asp	Gln	Leu	Met	Tyr		
			660					665					670				
ctg	gaa	cgt	gca	ttc	att	gat	cct	tta	ggc	tta	cca	gga	agg	cct	ttc	2064	
Leu	Glu	Arg	Ala	Phe	Ile	Asp	Pro	Leu	Gly	Leu	Pro	Gly	Arg	Pro	Phe		
		675					680					685					
tac	agg	cat	acc	atc	tat	gct	cca	agc	agc	cac	aac	aag	tat	gca	gga	2112	
Tyr	Arg	His	Thr	Ile	Tyr	Ala	Pro	Ser	Ser	His	Asn	Lys	Tyr	Ala	Gly		
	690					695					700						
gaa	tca	ttc	cct	ggg	att	tat	gat	gcc	ctt	ttt	gat	ata	agt	agc	aaa	2160	
Glu	Ser	Phe	Pro	Gly	Ile	Tyr	Asp	Ala	Leu	Phe	Asp	Ile	Ser	Ser	Lys		
705					710					715					720		
gtc	aat	gct	tct	aag	gcc	tg	aac	gaa	gtg	aag	aga	cag	att	tct	att	2208	
Val	Asn	Ala	Ser	Lys	Ala	Trp	Asn	Glu	Val	Lys	Arg	Gln	Ile	Ser	Ile		
				725					730					735			
gca	acc	ttt	aca	gtg	caa	gct	gca	gca	gag	act	ctg	agg	gaa	gta	gct	2256	
Ala	Thr	Phe	Thr	Val	Gln	Ala	Ala	Ala	Glu	Thr	Leu	Arg	Glu	Val	Ala		
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<212> PRT
<213> Mus musculus

<400> 8

Met Trp Asn Ala Leu Gln Asp Arg Asp Ser Ala Glu Val Leu Gly His
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Arg Gln Arg Trp Leu Arg Val Gly Thr Leu Val Leu Ala Leu Thr Gly
20 25 30

Thr Phe Leu Ile Gly Phe Leu Phe Gly Trp Phe Ile Lys Pro Ser Asn
35 40 45

Glu Ala Thr Gly Asn Val Ser His Ser Gly Met Lys Lys Glu Phe Leu
50 55 60

His Glu Leu Lys Ala Glu Asn Ile Lys Lys Phe Leu Tyr Asn Phe Thr
65 70 75 80

Arg Thr Pro His Leu Ala Gly Thr Gln Asn Asn Phe Glu Leu Ala Lys
85 90 95

Gln Ile His Asp Gln Trp Lys Glu Phe Gly Leu Asp Leu Val Glu Leu
100 105 110

Ser His Tyr Asp Val Leu Leu Ser Tyr Pro Asn Lys Thr His Pro Asn
115 120 125

Tyr Ile Ser Ile Ile Asn Glu Asp Gly Asn Glu Ile Phe Lys Thr Ser
130 135 140

Leu Ser Glu Gln Pro Pro Pro Gly Tyr Glu Asn Ile Ser Asp Val Val
145 150 155 160

Pro Pro Tyr Ser Ala Phe Ser Pro Gln Gly Thr Pro Glu Gly Asp Leu
165 170 175

Val Tyr Val Asn Tyr Ala Arg Thr Glu Asp Phe Phe Lys Leu Glu Arg
180 185 190

Glu Met Lys Ile Ser Cys Ser Gly Lys Ile Val Ile Ala Arg Tyr Gly
195 200 205

Lys Val Phe Arg Gly Asn Met Val Lys Asn Ala Gln Leu Ala Gly Ala
210 215 220

Lys Gly Met Ile Leu Tyr Ser Asp Pro Ala Asp Tyr Phe Val Pro Ala
225 230 235 240

Val Lys Ser Tyr Pro Asp Gly Trp Asn Leu Pro Gly Gly Gly Val Gln
245 250 255

Arg Gly Asn Val Leu Asn Leu Asn Gly Ala Gly Asp Pro Leu Thr Pro
260 265 270

Gly Tyr Pro Ala Asn Glu His Ala Tyr Arg His Glu Leu Thr Asn Ala
275 280 285

Val Gly Leu Pro Ser Ile Pro Val His Pro Ile Gly Tyr Asp Asp Ala
290 295 300

Gln Lys Leu Leu Glu His Met Gly Gly Pro Ala Pro Pro Asp Ser Ser
305 310 315 320

Trp Lys Gly Gly Leu Lys Val Pro Tyr Asn Val Gly Pro Gly Phe Ala
325 330 335

Gly Asn Phe Ser Thr Gln Lys Val Lys Met His Ile His Ser Tyr Thr
340 345 350

Lys Val Thr Arg Ile Tyr Asn Val Ile Gly Thr Leu Lys Gly Ala Leu
355 360 365

Glu Pro Asp Arg Tyr Val Ile Leu Gly Gly His Arg Asp Ala Trp Val
370 375 380

Phe Gly Gly Ile Asp Pro Gln Ser Gly Ala Ala Val Val His Glu Ile
385 390 395 400

Val Arg Ser Phe Gly Thr Leu Lys Lys Lys Gly Arg Arg Pro Arg Arg
405 410 415

Thr Ile Leu Phe Ala Ser Trp Asp Ala Glu Glu Phe Gly Leu Leu Gly
420 425 430

Ser Thr Glu Trp Ala Glu Glu His Ser Arg Leu Leu Gln Glu Arg Gly
435 440 445

Val Ala Tyr Ile Asn Ala Asp Ser Ser Ile Glu Gly Asn Tyr Thr Leu
450 455 460

Arg Val Asp Cys Thr Pro Leu Met Tyr Ser Leu Val Tyr Asn Leu Thr
465 470 475 480

Lys Glu Leu Gln Ser Pro Asp Glu Gly Phe Glu Gly Lys Ser Leu Tyr
485 490 495

Asp Ser Trp Lys Glu Lys Ser Pro Ser Pro Glu Phe Ile Gly Met Pro
500 505 510

Arg Ile Ser Lys Leu Gly Ser Gly Asn Asp Phe Glu Val Phe Phe Gln
515 520 525

Arg Leu Gly Ile Ala Ser Gly Arg Ala Arg Tyr Thr Lys Asn Trp Lys
530 535 540

Thr Asn Lys Val Ser Ser Tyr Pro Leu Tyr His Ser Val Tyr Glu Thr
545 550 555 560

Tyr Glu Leu Val Val Lys Phe Tyr Asp Pro Thr Phe Lys Tyr His Leu
565 570 575

Thr Val Ala Gln Val Arg Gly Ala Met Val Phe Glu Leu Ala Asn Ser
580 585 590

Ile Val Leu Pro Phe Asp Cys Gln Ser Tyr Ala Val Ala Leu Lys Lys
595 600 605

Tyr Ala Asp Thr Ile Tyr Asn Ile Ser Met Lys His Pro Gln Glu Met
610 615 620

Lys Ala Tyr Met Ile Ser Phe Asp Ser Leu Phe Ser Ala Val Asn Asn
625 630 635 640

Phe Thr Asp Val Ala Ser Lys Phe Asn Gln Arg Leu Gln Glu Leu Asp
645 650 655

Lys Ser Asn Pro Ile Leu Leu Arg Ile Met Asn Asp Gln Leu Met Tyr

660

665

670

Leu Glu Arg Ala Phe Ile Asp Pro Leu Gly Leu Pro Gly Arg Pro Phe
 675 680 685

Tyr Arg His Thr Ile Tyr Ala Pro Ser Ser His Asn Lys Tyr Ala Gly
 690 695 700

Glu Ser Phe Pro Gly Ile Tyr Asp Ala Leu Phe Asp Ile Ser Ser Lys
 705 710 715 720

Val Asn Ala Ser Lys Ala Trp Asn Glu Val Lys Arg Gln Ile Ser Ile
 725 730 735

Ala Thr Phe Thr Val Gln Ala Ala Ala Glu Thr Leu Arg Glu Val Ala
 740 745 750

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 <213> Mus musculus

<220>
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 Met Lys Lys Glu Phe Leu His Glu Leu Lys Ala Glu Asn Ile Lys Lys
 1 5 10 15
 ttt tta tac aat ttc aca cgg aca cca cac ttg gca gga aca caa aat 96
 Phe Leu Tyr Asn Phe Thr Arg Thr Pro His Leu Ala Gly Thr Gln Asn
 20 25 30
 aat ttt gag ctt gca aag caa att cat gac cag tgg aaa gaa ttt ggc 144
 Asn Phe Glu Leu Ala Lys Gln Ile His Asp Gln Trp Lys Glu Phe Gly
 35 40 45
 ctg gat ttg gtt gag tta tcc cat tac gat gtc ttg ctg tcc tat cca 192
 Leu Asp Leu Val Glu Leu Ser His Tyr Asp Val Leu Leu Ser Tyr Pro
 50 55 60
 aat aaa act cat cct aac tat atc tca ata att aat gaa gat gga aat 240
 Asn Lys Thr His Pro Asn Tyr Ile Ser Ile Ile Asn Glu Asp Gly Asn
 65 70 75 80
 gag att ttc aaa aca tca tta tct gaa cag cca ccc cca gga tat gag 288
 Glu Ile Phe Lys Thr Ser Leu Ser Glu Gln Pro Pro Pro Gly Tyr Glu
 85 90 95

aat ata tca gat gta gtg cca cca tac agt gcc ttc tct cca caa ggg	336
Asn Ile Ser Asp Val Val Pro Pro Tyr Ser Ala Phe Ser Pro Gln Gly	
100 105 110	
aca cca gag ggt gat cta gtg tat gtc aac tat gca cga act gaa gac	384
Thr Pro Glu Gly Asp Leu Val Tyr Val Asn Tyr Ala Arg Thr Glu Asp	
115 120 125	
ttc ttt aaa ctg gaa cgg gaa atg aag atc agt tgt tct ggg aag att	432
Phe Phe Lys Leu Glu Arg Glu Met Lys Ile Ser Cys Ser Gly Lys Ile	
130 135 140	
gtg att gcc aga tat ggg aaa gtg ttc aga gga aat atg gtt aaa aat	480
Val Ile Ala Arg Tyr Gly Lys Val Phe Arg Gly Asn Met Val Lys Asn	
145 150 155 160	
gct caa ctg gca ggg gca aaa gga atg att ctg tac tca gac cct gct	528
Ala Gln Leu Ala Gly Ala Lys Gly Met Ile Leu Tyr Ser Asp Pro Ala	
165 170 175	
gac tac ttt gtt cct gcg gtg aag tcc tat cca gat ggc tgg aac ctc	576
Asp Tyr Phe Val Pro Ala Val Lys Ser Tyr Pro Asp Gly Trp Asn Leu	
180 185 190	
cct gga ggt ggt gtc caa cgt gga aat gtc tta aat ctt aat ggt gca	624
Pro Gly Gly Gly Val Gln Arg Gly Asn Val Leu Asn Leu Asn Gly Ala	
195 200 205	
ggt gac ccg ctc aca cca ggt tac cca gca aat gaa cat gct tat agg	672
Gly Asp Pro Leu Thr Pro Gly Tyr Pro Ala Asn Glu His Ala Tyr Arg	
210 215 220	
cat gag ttg aca aac gct gtt ggc ctt cca agt att cct gtc cat cct	720
His Glu Leu Thr Asn Ala Val Gly Leu Pro Ser Ile Pro Val His Pro	
225 230 235 240	
att gga tat gat gat gca cag aaa ctc tta gaa cac atg ggt ggt cca	768
Ile Gly Tyr Asp Asp Ala Gln Lys Leu Leu Glu His Met Gly Gly Pro	
245 250 255	
gca ccc cct gac agt agc tgg aag gga gga tta aaa gtg cct tac aac	816
Ala Pro Pro Asp Ser Ser Trp Lys Gly Gly Leu Lys Val Pro Tyr Asn	
260 265 270	
gtg gga cct ggc ttt gct gga aac ttt tca aca caa aag gtc aag atg	864
Val Gly Pro Gly Phe Ala Gly Asn Phe Ser Thr Gln Lys Val Lys Met	
275 280 285	
cat att cac tct tac act aaa gtg aca aga atc tat aat gtc att ggc	912
His Ile His Ser Tyr Thr Lys Val Thr Arg Ile Tyr Asn Val Ile Gly	
290 295 300	
acc ctc aaa gga gct ctg gaa cca gac aga tat gtt att ctt gga ggt	960
Thr Leu Lys Gly Ala Leu Glu Pro Asp Arg Tyr Val Ile Leu Gly Gly	
305 310 315 320	
cac cga gac gct tgg gta ttt ggt ggc att gac cct cag agt gga gca	1008

His Arg Asp Ala Trp Val Phe Gly Gly Ile Asp Pro Gln Ser Gly Ala	
325 330 335	
gct gtt gtt cat gaa att gtg cgg agc ttt gga acc ctg aag aag aaa	1056
Ala Val Val His Glu Ile Val Arg Ser Phe Gly Thr Leu Lys Lys Lys	
340 345 350	
gga cgg agg cct aga agg aca att ttg ttt gca agc tgg gat gca gaa	1104
Gly Arg Arg Pro Arg Arg Thr Ile Leu Phe Ala Ser Trp Asp Ala Glu	
355 360 365	
gaa ttt ggc ctt ctt ggt tct act gag tgg gca gag gaa cat tca aga	1152
Glu Phe Gly Leu Leu Gly Ser Thr Glu Trp Ala Glu Glu His Ser Arg	
370 375 380	
ctc cta caa gag cga ggt gtg gct tat att aat gct gat tct tcc ata	1200
Leu Leu Gln Glu Arg Gly Val Ala Tyr Ile Asn Ala Asp Ser Ser Ile	
385 390 395 400	
gaa gga aat tac act cta aga gtt gat tgc aca cca ctg atg tac agc	1248
Glu Gly Asn Tyr Thr Leu Arg Val Asp Cys Thr Pro Leu Met Tyr Ser	
405 410 415	
tta gtg tac aac cta aca aaa gag ctg caa agc cca gat gaa ggt ttt	1296
Leu Val Tyr Asn Leu Thr Lys Glu Leu Gln Ser Pro Asp Glu Gly Phe	
420 425 430	
gaa gga aaa tct ctt tat gac agc tgg aaa gaa aag agt cct tca cct	1344
Glu Gly Lys Ser Leu Tyr Asp Ser Trp Lys Glu Lys Ser Pro Ser Pro	
435 440 445	
gag ttc att gga atg ccc aga att agc aag ctg ggg tct ggc aat gat	1392
Glu Phe Ile Gly Met Pro Arg Ile Ser Lys Leu Gly Ser Gly Asn Asp	
450 455 460	
ttt gaa gtg ttc ttc caa aga ctt gga att gct tca ggc aga gcc cga	1440
Phe Glu Val Phe Phe Gln Arg Leu Gly Ile Ala Ser Gly Arg Ala Arg	
465 470 475 480	
tat act aaa aat tgg aaa act aac aaa gtc agc agc tat cct ctc tat	1488
Tyr Thr Lys Asn Trp Lys Thr Asn Lys Val Ser Ser Tyr Pro Leu Tyr	
485 490 495	
cac agt gtc tat gaa aca tat gag ctg gta gta aaa ttt tat gac cca	1536
His Ser Val Tyr Glu Thr Tyr Glu Leu Val Val Lys Phe Tyr Asp Pro	
500 505 510	
aca ttt aaa tac cac ctc act gtg gcc cag gtt cga gga gcg atg gta	1584
Thr Phe Lys Tyr His Leu Thr Val Ala Gln Val Arg Gly Ala Met Val	
515 520 525	
ttt gaa ctt gcc aat tct ata gtg ctt ccc ttt gac tgc caa agt tat	1632
Phe Glu Leu Ala Asn Ser Ile Val Leu Pro Phe Asp Cys Gln Ser Tyr	
530 535 540	
gct gta gct ctg aag aag tat gct gac act atc tac aat att tca atg	1680
Ala Val Ala Leu Lys Lys Tyr Ala Asp Thr Ile Tyr Asn Ile Ser Met	

545	550	555	560	
aaa cat cca caa gaa atg aag gct tac atg ata tca ttt gat tca ctg				1728
Lys His Pro Gln Glu Met Lys Ala Tyr Met Ile Ser Phe Asp Ser Leu				
	565	570	575	
ttt tct gca gtc aat aat ttt aca gat gtt gca tct aag ttc aat cag				1776
Phe Ser Ala Val Asn Asn Phe Thr Asp Val Ala Ser Lys Phe Asn Gln				
	580	585	590	
aga ctg caa gag tta gac aaa agc aac ccc ata tta ctg aga att atg				1824
Arg Leu Gln Glu Leu Asp Lys Ser Asn Pro Ile Leu Leu Arg Ile Met				
	595	600	605	
aat gac cag ctg atg tat ctg gaa cgt gca ttc att gat cct tta ggc				1872
Asn Asp Gln Leu Met Tyr Leu Glu Arg Ala Phe Ile Asp Pro Leu Gly				
	610	615	620	
tta cca gga agg cct ttc tac agg cat acc atc tat gct cca agc agc				1920
Leu Pro Gly Arg Pro Phe Tyr Arg His Thr Ile Tyr Ala Pro Ser Ser				
	625	630	635	640
cac aac aag tat gca gga gaa tca ttc cct ggg att tat gat gcc ctt				1968
His Asn Lys Tyr Ala Gly Glu Ser Phe Pro Gly Ile Tyr Asp Ala Leu				
	645	650	655	
ttt gat ata agt agc aaa gtc aat gct tct aag gcc tgg aac gaa gtg				2016
Phe Asp Ile Ser Ser Lys Val Asn Ala Ser Lys Ala Trp Asn Glu Val				
	660	665	670	
aag aga cag att tct att gca acc ttt aca gtg caa gct gca gca gag				2064
Lys Arg Gln Ile Ser Ile Ala Thr Phe Thr Val Gln Ala Ala Ala Glu				
	675	680	685	
act ctg agg gaa gta gct				2082
Thr Leu Arg Glu Val Ala				
	690			

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 <211> 694
 <212> PRT
 <213> Mus musculus

<400> 10

Met Lys Lys Glu Phe Leu His Glu Leu Lys Ala Glu Asn Ile Lys Lys
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Phe Leu Tyr Asn Phe Thr Arg Thr Pro His Leu Ala Gly Thr Gln Asn
20 25 30

Asn Phe Glu Leu Ala Lys Gln Ile His Asp Gln Trp Lys Glu Phe Gly
35 40 45

Leu Asp Leu Val Glu Leu Ser His Tyr Asp Val Leu Leu Ser Tyr Pro
50 55 60

Asn Lys Thr His Pro Asn Tyr Ile Ser Ile Ile Asn Glu Asp Gly Asn
65 70 75 80

Glu Ile Phe Lys Thr Ser Leu Ser Glu Gln Pro Pro Pro Gly Tyr Glu
85 90 95

Asn Ile Ser Asp Val Val Pro Pro Tyr Ser Ala Phe Ser Pro Gln Gly
100 105 110

Thr Pro Glu Gly Asp Leu Val Tyr Val Asn Tyr Ala Arg Thr Glu Asp
115 120 125

Phe Phe Lys Leu Glu Arg Glu Met Lys Ile Ser Cys Ser Gly Lys Ile
130 135 140

Val Ile Ala Arg Tyr Gly Lys Val Phe Arg Gly Asn Met Val Lys Asn
145 150 155 160

Ala Gln Leu Ala Gly Ala Lys Gly Met Ile Leu Tyr Ser Asp Pro Ala
165 170 175

Asp Tyr Phe Val Pro Ala Val Lys Ser Tyr Pro Asp Gly Trp Asn Leu
180 185 190

Pro Gly Gly Gly Val Gln Arg Gly Asn Val Leu Asn Leu Asn Gly Ala
195 200 205

Gly Asp Pro Leu Thr Pro Gly Tyr Pro Ala Asn Glu His Ala Tyr Arg
210 215 220

His Glu Leu Thr Asn Ala Val Gly Leu Pro Ser Ile Pro Val His Pro
225 230 235 240

Ile Gly Tyr Asp Asp Ala Gln Lys Leu Leu Glu His Met Gly Gly Pro
245 250 255

Ala Pro Pro Asp Ser Ser Trp Lys Gly Gly Leu Lys Val Pro Tyr Asn
260 265 270

Val Gly Pro Gly Phe Ala Gly Asn Phe Ser Thr Gln Lys Val Lys Met
275 280 285

His Ile His Ser Tyr Thr Lys Val Thr Arg Ile Tyr Asn Val Ile Gly
290 295 300

Thr Leu Lys Gly Ala Leu Glu Pro Asp Arg Tyr Val Ile Leu Gly Gly
305 310 315 320

His Arg Asp Ala Trp Val Phe Gly Gly Ile Asp Pro Gln Ser Gly Ala
325 330 335

Ala Val Val His Glu Ile Val Arg Ser Phe Gly Thr Leu Lys Lys Lys
340 345 350

Gly Arg Arg Pro Arg Arg Thr Ile Leu Phe Ala Ser Trp Asp Ala Glu
355 360 365

Glu Phe Gly Leu Leu Gly Ser Thr Glu Trp Ala Glu Glu His Ser Arg
370 375 380

Leu Leu Gln Glu Arg Gly Val Ala Tyr Ile Asn Ala Asp Ser Ser Ile
385 390 395 400

Glu Gly Asn Tyr Thr Leu Arg Val Asp Cys Thr Pro Leu Met Tyr Ser
405 410 415

Leu Val Tyr Asn Leu Thr Lys Glu Leu Gln Ser Pro Asp Glu Gly Phe
420 425 430

Glu Gly Lys Ser Leu Tyr Asp Ser Trp Lys Glu Lys Ser Pro Ser Pro
435 440 445

Glu Phe Ile Gly Met Pro Arg Ile Ser Lys Leu Gly Ser Gly Asn Asp
450 455 460

Phe Glu Val Phe Phe Gln Arg Leu Gly Ile Ala Ser Gly Arg Ala Arg
465 470 475 480

Tyr Thr Lys Asn Trp Lys Thr Asn Lys Val Ser Ser Tyr Pro Leu Tyr
485 490 495

His Ser Val Tyr Glu Thr Tyr Glu Leu Val Val Lys Phe Tyr Asp Pro

500

505

510

Thr Phe Lys Tyr His Leu Thr Val Ala Gln Val Arg Gly Ala Met Val
 515 520 525

Phe Glu Leu Ala Asn Ser Ile Val Leu Pro Phe Asp Cys Gln Ser Tyr
 530 535 540

Ala Val Ala Leu Lys Lys Tyr Ala Asp Thr Ile Tyr Asn Ile Ser Met
 545 550 555 560

Lys His Pro Gln Glu Met Lys Ala Tyr Met Ile Ser Phe Asp Ser Leu
 565 570 575

Phe Ser Ala Val Asn Asn Phe Thr Asp Val Ala Ser Lys Phe Asn Gln
 580 585 590

Arg Leu Gln Glu Leu Asp Lys Ser Asn Pro Ile Leu Leu Arg Ile Met
 595 600 605

Asn Asp Gln Leu Met Tyr Leu Glu Arg Ala Phe Ile Asp Pro Leu Gly
 610 615 620

Leu Pro Gly Arg Pro Phe Tyr Arg His Thr Ile Tyr Ala Pro Ser Ser
 625 630 635 640

His Asn Lys Tyr Ala Gly Glu Ser Phe Pro Gly Ile Tyr Asp Ala Leu
 645 650 655

Phe Asp Ile Ser Ser Lys Val Asn Ala Ser Lys Ala Trp Asn Glu Val
 660 665 670

Lys Arg Gln Ile Ser Ile Ala Thr Phe Thr Val Gln Ala Ala Ala Glu
 675 680 685

Thr Leu Arg Glu Val Ala
 690

<210> 11

<211> 45

<212> DNA

<213> Clostridium tetani

<220>

<221> CDS
<222> (1)..(45)

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Gln Tyr Ile Lys Ala Asn Ser Lys Phe Ile Gly Ile Thr Glu Leu
1 5 10 15

<210> 12
<211> 15
<212> PRT
<213> Clostridium tetani

<400> 12
Gln Tyr Ile Lys Ala Asn Ser Lys Phe Ile Gly Ile Thr Glu Leu
1 5 10 15

<210> 13
<211> 63
<212> DNA
<213> Clostridium tetani

<220>
<221> CDS
<222> (1)..(63)

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ttc aac aac ttc acc gta agc ttc tgg ctg cgt gtt ccg aaa gtt agc 48
Phe Asn Asn Phe Thr Val Ser Phe Trp Leu Arg Val Pro Lys Val Ser
1 5 10 15

gct agc cac ctg gaa 63
Ala Ser His Leu Glu
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<210> 14
<211> 21
<212> PRT
<213> Clostridium tetani

<400> 14
Phe Asn Asn Phe Thr Val Ser Phe Trp Leu Arg Val Pro Lys Val Ser
1 5 10 15

Ala Ser His Leu Glu
20

<210> 15
<211> 25
<212> PRT

<213> artificial sequence

<220>

<223> Fusion of tetanus toxoid epitope and PSM

<400> 15

Gln Glu Arg Gly Val Glu Tyr Ile Lys Ala Asn Ser Lys Phe Ile Gly
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Ile Thr Glu Leu Arg Val Asp Cys Thr
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<210> 16

<211> 25

<212> PRT

<213> artificial sequence

<220>

<223> Fusion of tetanus toxoid epitope and PSM

<400> 16

Ala Val Val Leu Arg Gln Tyr Ile Lys Ala Asn Ser Lys Phe Ile Gly
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<223> Fusion of tetanus toxoid epitope and PSM

<400> 17

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Ile Thr Glu Leu His Val Ile Tyr Ala
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<223> Fusion of tetanus toxoid epitope and PSM

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Val Pro Lys Val Ser Ala Ser His Leu Glu Val Asp Cys Thr Pro

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His His His His His His
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Met Lys His Gln His Gln His Gln His Gln His Gln His Gln
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Met Asp Ala Met Lys Arg Gly Leu Cys Cys Val Leu Leu Leu Cys Gly
1 5 10 15

gca gtc ttc gtt tcg ccc agc 69
Ala Val Phe Val Ser Pro Ser
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<210> 26
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<400> 26

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Ala Val Phe Val Ser Pro Ser
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Phe Phe Phe Phe Ala Pro Ala Ser Ser
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<212> PRT
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<400> 30

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Trp Ala Thr Ala
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Pro Ala Pro Gly Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala
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Pro Asp Thr Arg
20

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